

REMARKS

The remarks below are made in response to the Final Office action of May 14, 2007. The Examiner's reconsideration is respectfully requested in view of at least the following remarks.

Claims 1-21 are pending in the Application. Claims 1-21 stand as previously presented. No amendments have been made, and no new matter has been added.

Claim Rejections under 35 U.S.C. § 112

Claims 1-16 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. The Examiner states on pages 6-7 of the Office action that the claims contain "subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed, had possession of the claimed invention." Specifically, the Examiner states that the limitation *voltage supplying unit to apply AC voltage synchronized with the modulated signal to the light source so as to drive the light source* in previously amended claim 1 has no specification or original claim support. Applicant respectfully traverses for at least the following reasons.

First, Applicant respectfully suggests that there is support in at least the specification and drawings as originally filed for a voltage supplying unit. Specifically, the claimed invention is clearly an emissive-type display device, as the claimed invention has a backlight unit (see page 6, lines 8, 15 and 18 as well as FIG. 1 [backlight unit 340] and FIG. 2 [lamp unit 910] of the application as filed). Furthermore, the lamps (item 341 of FIG. 1 in the application as filed) are distinctly disclosed as being emissive-type lamps, e.g., cold cathode fluorescent lamps, external cathode fluorescent lamps or light emitting diode lamps (page 6, lines 21-22 of the application as filed), and thus require power to drive them. Additionally, the lamp unit (FIG. 2, item 910 of the application as filed) is supplied with a lamp current LDS, implying that a source, i.e., the voltage supplying unit disclosed in claim 1, supplies the lamp current LDS. More specifically, in an exemplary embodiment of the present invention shown in FIG. 4 (items 910 and 921) and described in the specification at page 11, lines 18 and 21-22, the voltage supplying unit is a transformer 921 driving the lamp unit 910 with the lamp current LDS.

Second, Applicant respectfully suggests that there is support in at least the specification and drawings as originally filed for the voltage supplying unit...to apply AC voltage. In particular, the transformer 921 in FIG. 4 in the application as filed, which is an example of a voltage supplying unit according to one exemplary embodiment of the present invention, generates “a sinusoidal signal,” e.g., an AC voltage, which is provided to the lamp unit as the lamp current LDS, as disclosed at page 13, lines 21-23 of the instant application as filed. Further support is found for this contention in FIG. 5 (item LDS), wherein the lamp current LDS is clearly an alternating current, e.g., a sinusoidal signal having positive and negative amplitudes a and b, respectively, which are of substantially the same value (i.e., magnitude) (page 13, lines 25-26 of the application as filed).

Third, Applicant respectfully suggests that there is support in at least the specification and drawings as originally filed for the AC voltage...synchronized with the modulated signal. Specifically, the instant application as filed discloses on page 13, lines 19-24 that the transformer, e.g., the voltage supplying unit, generates the sinusoidal signal (as described above) based on the on/off signal SW, i.e., the modulated signal. Further, referring to FIG. 5 (item LDS) of the application as filed, the positive and negative cycles of the lamp current LDS clearly correspond to positive and negative pulses of the signal SW, i.e., the signals LDS and SW are synchronized.

Finally, Applicant respectfully suggests that there is support in at least the specification and drawings as originally filed for the AC voltage being applied...to the light source so as to drive the light source. As described above, the inverter having the transformer, i.e., the voltage supplying unit according to an exemplary embodiment of the present invention, “drives the lamp unit” (page 11, line 18 of the application as filed). Further, FIG. 2 (items 900, 910 and 920) of the application as filed shows the lamp current LDS being supplied to the lamp unit 910.

In summary, Applicant respectfully submits that there is support in at least the specification and drawings as originally filed for the limitation “voltage supplying unit (transformer) to apply AC voltage (sinusoidal signal) synchronized with the modulated signal (signal SW and lamp current LDS are synchronized) to the light source (lamp unit/lamps) so as to drive (transformer drives the lamp unit) the light source” in claim 1.

Thus, Applicant respectfully submits that independent claim 1 and claims 2-16 depending therefrom are described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Accordingly, it is respectfully submitted that the rejection of claims 1-16 under 35 U.S.C. § 112, first paragraph, be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

In order for an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). See MPEP 2143.

Claims 17-18 and 20-21 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Tanaka et al. (U.S. Patent No. 6,011,534, hereinafter "Tanaka") in view of Jefferson (U.S. Patent No. 6,127,865, hereinafter "Jefferson"). Applicant respectfully traverses for at least the following reasons.

The Examiner states that Tanaka discloses all of the elements of claims 17 and 18.

It is respectfully noted that Tanaka teaches a method for applying a signal voltage to pixel electrodes (Column 6, lines 62-63), wherein the method includes generating a signal, detecting a phase difference between the generated signal and a horizontal synchronization signal, and adjusting a frequency of the generated signal in response to the detected phase difference to provide a timing signal used to generate a signal voltage provided to pixel electrodes (Col. 6, lines 56-58; Col. 7, lines 1-10; and FIGS. 1-2).

Tanaka does not teach or suggest, however, providing a driving signal to the light source in response to the adjusted reference signal as in original claim 17 of the application as filed.

On page 3 of the Office action, the Examiner has likened the pixel electrode of Tanaka to the light source of the present invention, an analogy which the Applicant respectfully disagrees with. As disclosed in Col. 6, lines 42-44 of Tanaka, the pixel electrode is for "applying the signal voltage to a liquid crystal." Further, "the light transmittance of the liquid crystal varies depending on a signal voltage to be applied to the respective pixel electrodes. An image is displayed by modulating incident light according to the variation of the light transmittance and by transmitting the modulated light" (Col. 6, lines 56-61). As would be well known to those of ordinary skill in the art, the incident light does not come from the pixel electrodes, or even the liquid crystal layer itself. Rather, the incident light must be supplied by a lamps, for example, in a separate light source (as in a transmissive liquid crystal display device), be reflected external light (as in a reflective liquid crystal display device) or both (as in a transmissive liquid crystal display device). Thus, there is no teaching or suggestion in Tanaka to provide a driving signal to a light source, in contrast and in accordance with claim 17 of the present invention.

It is further respectfully noted that there is no teaching or suggestion in Jefferson to supply a driving signal to the light source in response to the adjusted reference signal, as in original claim 17 of the application as filed.

Thus, Applicant respectfully submits that claim 17, and claims depending therefrom, i.e., claims 18-21, of the present invention are patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claims 17-18 and 20-21 under 35 U.S.C. § 103(a) be withdrawn.

Further regarding the rejection of claim 20 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Tanaka in view of Jefferson, the applicant respectfully traverses for at least the following additional reasons.

The Examiner has stated that Tanaka teaches all elements of claim 20 except *performing pulse width modulation and dividing a frequency of the modulated signal to generate a frequency-divided signal*, which the Examiner has stated is taught by Jefferson, primarily at Col. 5, lines 64-65 and column 8, lines 44-53.

It is respectfully noted that Jefferson teaches a divide-by-two circuit which divides a frequency. However, Jefferson does not teach or suggest performing pulse width modulation, in contrast to and accordance with claim 20 of the present invention.

Thus, Applicant respectfully submits that claim 20 of the present invention is patentable over the cited references for this additional reason, as well.

Accordingly, it is respectfully submitted that the rejection of claim 20 under 35 U.S.C. § 103(a) be withdrawn.

Claims 1 and 9 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Tsunoda et al. (U.S. Patent No. 5,912,713, hereinafter "Tsunoda") in view of Kang (U.S. Patent Application Publication No. 2004/0004596 A1, hereinafter "Kang"). Applicant respectfully traverses for at least the following reasons.

The Examiner has stated that Tsunoda teaches all elements of claim 1 except *a voltage supplying unit to apply AC voltage synchronized with the modulated signal to the light source so as to drive the light source*, which the Examiner has stated is taught by Kang, primarily at paragraphs [0002], [0014-0015], [0029] and [0072]-[0076] and FIGS. 4-5.

However, contrary to the Examiner's allegation on page 8 of the Office action, neither Tsunoda nor Kang teach or suggest a controller to modulate the reference signal in response to the control signal and output a modulated signal, as in claim 1 of the present invention. More specifically, Applicant respectfully submits that the Examiner's allegation that the selector (item 26 in FIG. 3 of Tsunoda) teaches the "controller to modulate the reference signal in response to the control signal and output a modulated signal" of claim 1 in the instant invention is incorrect, in that (referring to FIG. 3 of Tsunoda) the selector is incorrectly disposed, both physically and electrically, to teach the controller disclosed in claim 1 (item CTN in FIG. 4 in the application as filed). Further, the selector, as described in Tsunoda at column 6, lines 49-53, merely selects one of two

signals, i.e., operates as a switch, and thus is not analogous to the controller of claim 1 (shown in FIG. 4, item 930 of the application as filed) which, in contrast and in accordance with the present invention, modulates the reference signal in response to the control signal and outputs a modulated signal to the phase comparator (page 13, lines 14-16; page 14, lines 6-8; and page 15, lines 22-25 of the application as filed).

In further support of this argument, Applicant respectfully notes that the signal fv in FIG. 3 of Tsunoda, which the Examiner aptly likens to the modulated signal outputted by the controller of claim 1 of the instant invention, is clearly seen as not originating from the selector in FIG. 3 of Tsunoda. Rather, the signal fv is outputted from the frequency divider of Tsunoda, which is analogous only to the frequency divider of dependent claim 9 of the present invention (FIG. 4, item 955 of the application as filed).

Thus, Tsunoda fails to teach or suggest *a controller to modulate the reference signal in response to the control signal and output a modulated signal*, as in claim 1 of the present invention.. Furthermore, to electrically connect the alleged controller of Tsunoda, i.e., the selector of FIG. 3, in the same manner as the controller of the instant invention would render the invention taught in Tsunoda inoperable. Therefore, Tsunoda actually teaches away from using a controller as in the present invention.

Regardless, assuming, *arguendo* that Tsunoda teaches *a controller to modulate the reference signal in response to the control signal and output a modulated signal*, as alleged by the Examiner, it is respectfully noted that Kang fails to cure the deficiencies of Tsunoda noted by the Examiner on page 9 of the Office action, i.e., *a voltage supplying unit to apply AC voltage synchronized with the modulated signal to the light source so as to drive the light source*, which the Examiner has stated is taught by Kang, primarily at paragraphs [0002], [0014-0015], [0029] and [0072]-[0076] and FIGS. 4-5.

While it is respectfully noted that Kang teaches a voltage supplying unit to apply an AC voltage to drive a light source, primarily at paragraphs [0002] and [0014] and in FIGS. 4-5, Kang does not teach or suggest, however, an *AC voltage synchronized with the modulated signal*, in contrast to and in accordance with claim 1 of the present invention. More specifically, the modulated signal of Kang, output from the light controller (item 930 of FIGS. 4 and 5), is a DC signal, as disclosed in paragraph [0074], wherein the current detecting signal CDS, to be modulated by the light controller 930 and

output therefrom to control the AC voltage supplied to the lamp unit 920, is “a DC current detecting signal.” Thus, it is impossible for the AC voltage applied to the lamps unit to be synchronized with the modulated (DC) signal of Kang, in contrast to and in accordance with claim 1 of the present invention.

Thus, Applicant respectfully submits that claim 1 and all claims depending therefrom, i.e., claims 2-16, and, more specifically, claim 9 of the present invention are patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claims 1 and 9 under 35 U.S.C. § 103(a) be withdrawn.

Allowable Subject Matter

Claim 19 is objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Applicant gratefully acknowledges the Examiner's noting the allowable subject matter in claim 19, but Applicant respectfully submits that claim 19 is allowable as depending upon allowable claim 17. As such, Applicant has not rewritten claim 19 in independent form at this time.

Conclusion

In light of the above remarks, the present application including claims 1-21 is believed to be in condition for allowance. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the outstanding rejections.

If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is cordially requested to telephone the undersigned.

If there are any charges due with respect to this response, please charge them to Deposit Account No. 06-1130 maintained by Applicant's Attorneys.

Respectfully submitted,

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